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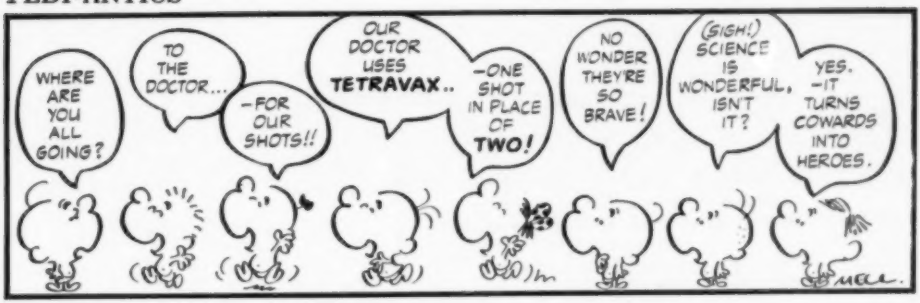
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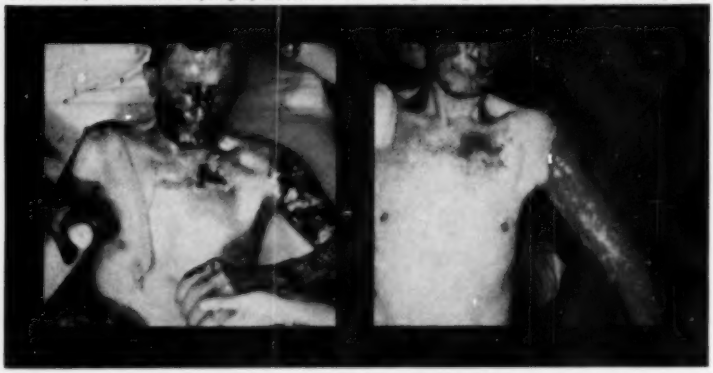

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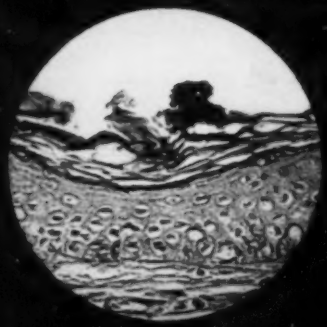

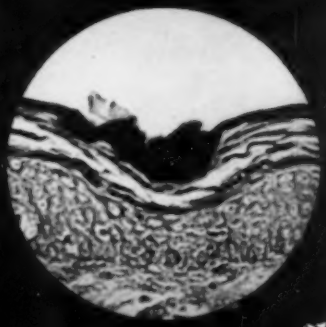

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1. Spoor, H. J.: New York St. J. M. 60:2863, 1960.
2. Wiese, H. F., et al.: J. Nutrition 66:345, 1958.
3. Smith, L. W., et al.: Amer. J. Med. Sc. 237:600, 1959
4. Nutrition Reviews 17:136, 1959.

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2. Kahan, H. *et al.*: Arch. Ped. 73:125 (Apr.) 1956.
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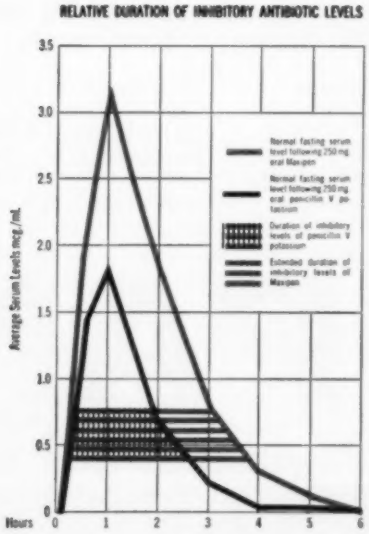

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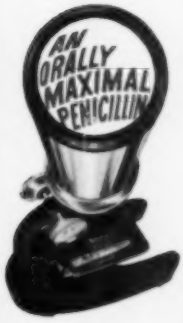

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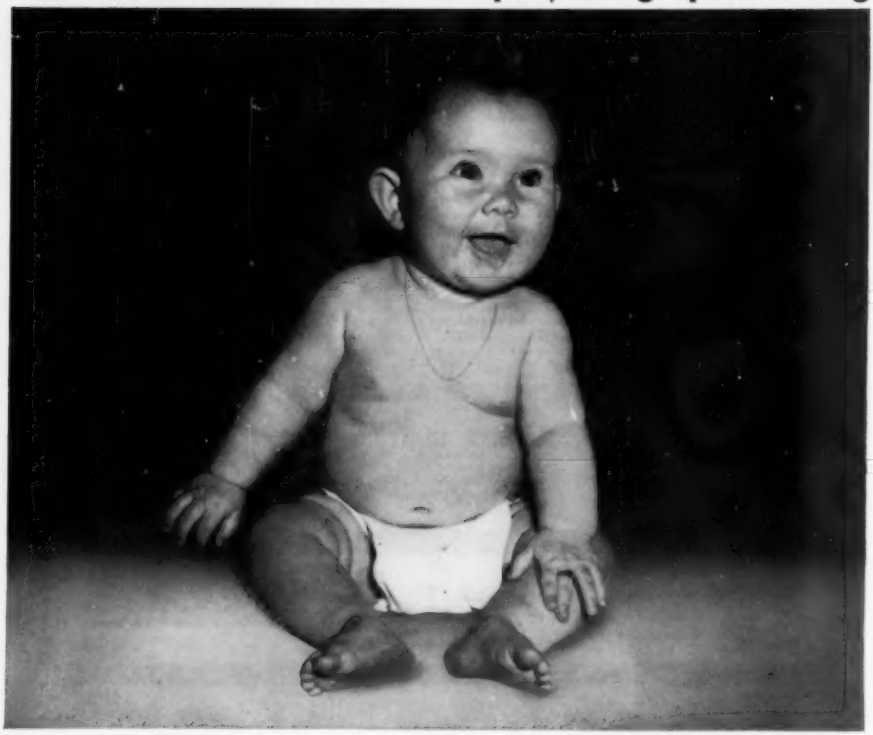

Agenesis of the Left Lung

CASE REPORT*

MICHAEL A. BRESCIA, M.D.**
E. E. AMERMAN, M.D.†
K. K. SHARMA, M.D.††
New York

Although agenesis of one or both lungs is not an extremely rare anomaly, it is sufficiently infrequent in occurrence to warrant reporting a case of agenesis of the left lung. Since one is not ordinarily faced with this type of anomaly, this condition does not readily come to mind in considering the differential diagnosis of diseases of the chest.

The first recorded case of agenesis of the lung was that of de Pozzi[1] in 1673. This was a case of absence of the left lung which was discovered in an adult female at autopsy. In addition to the agenesis of the lung, there was also recorded an abnormally shortened intestinal tract and an enlarged spleen. A review of the literature reveals that the left lung[1-32] is absent twice as often as that of the right lung [29,32-44]. There have been five reports of agenesis of both lungs[45-49]. Anomalous conditions of the lobes as well as complete absence of the lungs have also been reported. Absence of part of the left lung was reported by Gartside[50]. Absence of part of the right lung has also been reported [30,47] in addition to a two lobed[2,6] and one lobed right lung[51,52,53]. The sex distribution is about equal. Although many of the cases of agenesis of the lungs are diagnosed during life, a like number of unrecognized cases are discovered at autopsy. The age distribution of the cases reviewed was as follows: stillborn or fetus—6 cases; newborn—16 cases; 0-1 year—6 cases; 2-10 years—8 cases; 11-20 years—5 cases; over 20 years—18 cases.

There have been many other anomalies associated with agenesis of the lungs involving practically all systems. This is not unexpected since one anomaly begets others. There has been no pattern

*From the Pediatric Service of Dr. E. E. Amerman, City Hospital at Elmhurst, Elmhurst, N. Y.
**Attend. Ped., St. John's Hospital, Long Island City, N. Y. Asso. Attend. Ped., City Hospital at Elmhurst, Elmhurst, N. Y.
†Attend. Ped., City Hospital at Elmhurst, Elmhurst, N. Y.
††Former Pediatric Resident, City Hospital at Elmhurst, Elmhurst, N. Y.

of associated anomalies. However, the most common associated anomaly was that involving the heart. There were seven with enlarged heart[4,5,12,21,28,34,47], five with septal defects, two of which were atrial[30,34] and three ventricular[32,34,38], four dextrocardias [29,38,42,52], three with patent ductus arteriosus[21,34,35] and one tetralogy of Fallot[30].

CASE REPORT

A negro girl of eight and one-half months was admitted to the City Hospital at Elmhurst because of a respiratory infection and fever of six days duration. The prenatal and neonatal history was uneventful. The delivery was spontaneous and there was no history of perinatal distress. Birth weight was 6 lbs. 11 oz. Development and growth to date had been satisfactory. The mother has arrested pulmonary tuberculosis and is in apparent good health. The remainder of the history was non contributory.

Examination revealed a well developed, well nourished negro female infant not acutely ill or distressed. Weight-17 lbs. Temperature-101. Pulse-110. Respiration-24. No cyanosis or dyspnoea. Tissue turgor was good. The head, hair, scalp, ears and eyes were normal. There was a muco-purulent nasal discharge. Tongue was moderately coated and the tonsils were slightly enlarged and injected but free from exudate or membrane. Cervical nodes were palpable bilaterally. The thorax was slightly asymmetric with depressed left side. There was complete dullness to percussion on the left side of the chest with hyperresonance on the right. On auscultation normal breath sounds were heard over the right chest but none were discernible on the left side except for a few crackling rales which were noted posteriorly. The heart sounds were regular without any adventitious sounds. The abdomen was soft. The liver and spleen were not palpable. The remainder of the examination was within normal limits.

An X-ray of the chest (fig. 1) revealed no aeration of the left hemithorax with a shift of the mediastinum to the left side. The cardiac borders could not be visualized since the heart was pushed to the involved side. The white blood count was 12,450 with 52% lymphocytes; the hemoglobin was 10.5 gms.; the erythrocyte sedimentation rate was not elevated; nose and throat culture was negative; urinalysis was normal. Intradermal tuberculin (P. P. D.) tests were done using dilutions from 1:10,000 to 1:100 and they were all negative.

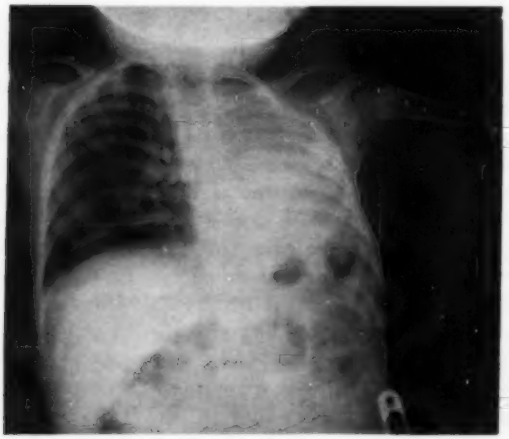

FIG. 1. Agenesis of the left lung. X-ray of chest demonstrates opacity of the left chest with compensatory emphysema of the right chest. The heart shadow is indistinct and blends in with the opacity of the left chest. Note the elevated diaphragm on the left side and the "bell shape" deformity of the upper ribs.

A tentative diagnosis of atelectasis was made. It was decided to perform a bronchoscopy to rule out the possibility of a non-opaque foreign body in the main left bronchus which might produce a similar picture. On bronchoscopic examination the carina was visualized. It was pushed upward and laterally to the left side. The right upper main bronchus' lumen was normal but was pushed anteriorly and medially. The left main bronchus was probed for about 3.0 Cm. when an obstruction was encountered. No other intrinsic pathology was observed but it seemed that a mass in the posterior mediatinum was displacing the bronchial tree as described above.

Since a definitive diagnosis was not established following X-ray studies and bronchoscopy a diagnostic thoracotomy was decided upon as the next diagnostic procedure and performed. The thoracic cage was opened at the fourth left interspace and complete absence of the lung was noted. A blind pouch was all that constituted the underdeveloped left main bronchus. There was some tissue overlying the region of the left upper lobe which was thought to be thymus and so confirmed on microscopic examination. The infant made a fine post-operative recovery and was discharged home.

DISCUSSION

Agenesis of one lung is compatible with a long and normal life and might go unnoticed and then discovered inadvertently. The symptoms might be completely absent or minimal. Some cases, particularly in the newborn period might show cyanosis and dyspnoea. The growth and development in the asymptomatic cases is normal except that the thorax would be asymmetrical with slight flattening of the involved side[42,54]. Scoliosis with diminished movements of the affected side has also been noted[55]. On examination there is generally flatness or dullness. However, a rare case might be hyperresonant on the involved side if there is marked hypertrophy of the remaining lung tissue. Breath sounds may be absent, diminished or bronchial in character, but more often than not they are either markedly diminished or absent. The heart and mediastinum are displaced toward the involved side and the apical impulse might be prominent. X-ray studies show the displacement of the heart and mediastinum, elevation of the diaphragm and narrowing of the intercostal spaces. The differential diagnosis usually poses quite a problem. A few of the conditions that might be considered in determining a diagnosis are massive atelectasis, foreign body in a main bronchus, paralysis of the diaphragm and diaphragmatic hernia. Among the diagnostic procedures that might be used to establish a definite diagnosis besides a careful history and physical examination are fluoroscopy, artificial pneumothorax, tomography, bronchoscopy with lipiodal studies and angiocardiography[58].

According to Potter's[56] classification of malformations of the lung, the case reported would be considered as a primary asymmetrical hypoplasia of the left lung. The lung might be completely absent as in the case reported or occasionally a rudiment of lung tissue might be present which can be attached directly to the trachea. The pleura might be absent or partially present in which case it might contain fluid, thymus or fat tissue. The pulmonary vessels on the affected side are absent. The pulmonary artery may be a single vessel from the right ventricle to the normal lung. The venous return from the normal lung would reach the left atrium by one or two vessels. These vessels may empty into the azygos vein. Pneumonia is a common finding and bronchiectatic emphysema is also found. One would have expected that there would be many cases of anomalous arteries and veins associated with absence of a lung but only three such were reported[21,26,30].

Potter[56] reports from her extensive experience that complete agenesis of pulmonary tissue is unknown except in acephalic monsters. However, the five cases of complete agenesis of the lungs reported in the literature (V. S.) were not associated with anomalies of the nervous system. There was one case of exencephaly reported with absence of the left lung[23]. Since the lungs arise as an outgrowth of the foregut[57] one would have anticipated many anomalies of the gastro-intestinal tract associated with lung anomalies. However, only three such cases were reported, one shortened intestinal tract (1), one tracheo-esophageal fistual (6) and one with multiple intestinal anomalies (38).

SUMMARY

A case of agenesis of the left lung in an eight and one-half month negro girl is reported. The lung findings were confusing and the condition finally diagnosed following thoracotomy. A brief review of the literature has also been presented.

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Dr. Brescia: 87-10 37th Avenue, Jackson Heights 72, New York.
Dr. Amerman: 151-15 35th Avenue, Flushing, New York.
Dr. Sharma: 115 Devi Deen Bag, Sultanbazar, Hyderabad, India.

The Adenoid Problem

JOSEPH LUBART, M.D., F.A.C.S.*
New York

Tonsillectomy is the most frequently done procedure in all of surgery. The advent of the sulpha drugs and later the antibiotics dampened somewhat the enthusiasm for this operation. The results achieved with the "wonder" drugs have made a great many practitioners regard the tonsil operation as rarely indicated. Are they justified in this belief? As a practicing otolaryngologist I would unequivocally say that they are right, with certain notable exceptions, as regards the tonsil itself. In the infrequent instances where tonsils are so large as to interfere with swallowing, no one would argue with the advisability of removal. The other exception is where a new growth of the tonsil is supected. Aside from these indications, the only value of a tonsillectomy, derives from the fact that the adenoids are usually removed at the same time. This important consideration has never been sufficiently emphasized.

It is certain that the tonsils as they are regarded today existed in children centuries ago. Though infrequent reference is made to them in early medical accounts, it is noted that Celsus clearly described the operation of tonsil enucleation. Though physiologists and anatomists described and discussed the functions of the tonsils in the succeeding years, clinicians manifested relatively little interest in the treatment of tonsils until about 1885. The hypertrophy of the postnasal lymphoid tissue (adenoid) was not considered of much importance until Meyer of Copenhagen in 1868 distinguished the baneful influence of this growth on the hearing and the general economy of the growing child and reported it to the medical profession.

Although the chemobiotics are of great value in combating and localizing acute upper respiratory infections they are valueless in removing the obstructive effect of enlarged adenoids which bring on these infections. In children the postnasal space or nasopharynx, is usually small; about one quarter by one third of an inch. Even moderate enlargement of the adenoids can fill this area and interfere with nasal respiration and sinus drainage. It is therefore as true

*Director of Otolaryngology, Lincoln Hospital, New York City.

now as it was in Osler's time when Sir William had this to say about obstructive adenoid growths: "The treatment of adenoid growths is of the greatest importance and should be thoroughly carried out. Parents should be frankly told that the infection is serious, one which impairs the mental, not less than the bodily development of the child . . . Practitioners do not appear to have grasped as yet the full importance of this disease. They are too apt to temporize and unnecessarily postpone radical (operative) measures . . . The good results of the operation are often apparent within a few days."

Dr. Emmett Holt Sr. of New York, well known as a consultant and teacher of pediatrics had this to say on the subject of adenoids: "Adenoids are a very common condition and very much neglected by the general practitioner. They are the source of nasal discomfort and the origin of more minor ailments than almost any other particular condition of childhood. The general health of the patients suffering from adenoids may be impaired from lack of oxygen due to obstructive respiration, from loss of sleep and from confinement to the house, necessitated by attacks of bronchitis or head colds. Marked anemia is often present. In old and neglected cases of a severe character, children may be stunted in growth and their facial expression dull and stupid. They are languid, listless, often depressed, and this with their deafness, frequently causes them to be regarded in schools as children who are somewhat deficient mentally."

Most authors stress the blocking of the Eustachian orifices in the nasopharynx and interference with nasal respiration of adenoid enlargement but fail to emphasize sufficiently the damaging effect of impairment of sinus drainage and ventilation. In 1921 Dean[1] gave a very extensive and comprehensive report of his studies in paranasal sinus disease in infants and children. Regarding the etiology of paranasal sinus disease, Dean found that the most common source of infection is from diseased adenoids and tonsils. He also found that involvement of the bone is much more common than in adults because the bone in the young is cancellous and soft. Dean stated that radiography is unreliable because of the thickness of the bones of the face.

Paranasal sinus disease in the young occurs much more frequently than is generally suspected and occurs in all stages of sinus development. Benner[2] found evidence of infection of the sinuses

in a large percentage of still-born and those who died under two days of age. Ebbs[3] found a 30% incidence of infection in one or more of the sinuses, in a group of children under 14 years of age, who died of a variety of causes. Schoenberg[4] found, empyema of one or several sinuses in 154 of 232 children, or 66.3 per cent, on autopsy in a similar study. From a preventive point of view the work of Thorkildsen[5] is more encouraging; of 204 children with sinusitis a majority had symptoms of nasal obstruction and rhinitis but in only 16 was the sinusitis of a chronic type, thus indicating that early removal of obstructive adenoid growths could reverse the progress of the sinusitis with significant reduction of the high incidence of sinus involvement in children.

Orbital cellulitis from spread of inflammation of anterior ethmoid cells, a common complication of upper respiratory infection in children; recurrent epistaxis due to sinusitis, and impaired hearing due to nasopharyngeal obstruction and infection are all caused in large measure by interference with postnasal drainage and the resultant sinusitis.

In marked contrast to other bodily ailments, the incidence of upper respiratory infections is as high or higher in children as it is in adults. The reasons for this are, mainly, the prevalence of exanthematous diseases in this age group, the comparatively large size of sinus openings, and impaired ventilation due to mouth breathing caused by adenoids which usually have regressed by the time the patient reaches adult life.

The only effective treatment for enlargement of the adenoids is surgical removal. Nose drops give only temporary relief and radiation is useful in shrinking small amounts of residual adenoid tissue in areas inaccessible to surgical approach. Adenoidectomy can be a most effective operation or only of temporary or no benefit depending on the adequacy of the removal. The operation should be done by one thoroughly trained in the technic, with visualization of the nasopharynx for complete adenoid removal and careful avoidance of injury to the Eustachian orifices and the superior pharyngeal constrictor muscle or its insertion. Too often the occasional operator may do a proper tonsillectomy but take only a few blind stabs with the adenotome leaving adenoid tissue in crucial areas with complete defeat of the purpose of the operation. While it is true, as Crowe[6] states, that lymphoid tissue is an integral part of the mucous membrane of this area thorough

removal will go a long way toward preventing a recurrence of obstructive adenoid growths. Tonsillectomy is usually not practiced before the child has reached the age of 4 or 5 years because of the possibility of regrowth and the possible interference with rapid growth of the pharyngeal soft parts. No such age restrictions exist with regard to the adenoids. They should be removed whenever there are nasopharyngeal obstructive symptoms. Adenoids have been removed in infants as young as several months with excellent results. In expert hands the procedure should take only a few minutes and involves little more surgery than a myringotomy.

SUMMARY

The symptoms caused by adenoid hypertrophy vary in different cases, but the following are the most common:

1, Mouth breathing, due to blocking of the post-nasal space by the adenoid growths, leading (the mouth breathing) to facial deformities, crooked teeth, sinus trouble, etc.

2, Frequent headcolds, croup and brochitis.

3, Earaches, running ears, mastoid infection and deafness.

4, Disturbed sleep and night terrors, due to obstructed breathing and resultant deficient supply of oxygen to the brain.

5, Nasopharyngeal catarrah and nasal discharge, either constant or recurring with each headcold.

6, Fetid breath, due to decomposition of retained secretion and the disordered stomach which is so often associated with adenoids.

7, Impairment of the voice. If the nostrils are completely blocked the voice loses the resonance it should obtain from the nasal cavity and sinuses and takes on a twang. The child is then, said to be talking through his nose, which is the very thing he is not doing because the nose is blocked.

8, Difficulty in eating. The necessity for breathing through his mouth interferes with the proper mastication of his food. The child is slow in eating or may develop a tendency to bolt his food without properly chewing it.

9, Snoring during sleep and sometimes noisy respiration even when awake.

10, Interference with the sense of smell, due to nasal blockage.

11, Mental dullness, due partly to infection and partly to asso-

ciated deafness brought on by the adenoids blocking the tube leading from the throat to the ear and the effects of lack of restful sleep as mentioned above.

Even though many of these children will outgrow these tendencies, a good many, as a result of repeated upper respiratory attacks, will be left with the seeds which in adult life will be the cause of catarrhal deafness and the annoyances and hazards of chronic sinusitis. Both conditions could be avoided if obstructive adenoid enlargements, which are not amenable to any drug therapy, had been removed early enough. Although it is the time honored custom to remove both the tonsils and the adenoids at the same time, there is little evidence to show that any of the benefits of the operation are due to the tonsillectomy itself. It is therefore not necessary to wait until the child is 4 or 5 years old until the child is given relief from obstructive adenoid enlargements. If the indications are important enough adenoidectomy should be done at any age from infancy on and tonsillectomy reserved for those cases where the tonsil hypertrophy creates a purely local problem.

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960 *Park Avenue, New York* 28

Hereditary Anhidrotic Ectodermal Dysplasia

REVIEW OF LITERATURE AND REPORT OF TWO CASES

S. Awwaad, M.D.Ch.* and M. El Essawy, D.Ch.*
Egypt

Hereditary anhidrotic ectodermal dysplasia is a rare condition of which up to 1947, only about 80 cases have been reported in the literature[1]. The condition is characterised mainly by anhidrosis, hypodontia or anodontia and hypotrichosis. The first description of the syndrome was given by Widderburn (1838)[2]. Later Christ (1913)[3] described a case and named it "Congenital Ectodermal Defect" and later still Weech (1929)[4], applied the term "Hereditary Anhidrotic Ectodermal Dysplasia" as being more accurately descriptive of the cause and of the most important symptom of the syndrome, namely inability to sweat. The syndrome has a wide racial distribution; reports have been made from many of the countries of North America, Europe and Asia. To the authors' knowledge, the present two cases are the first to be reported from Egypt.

ETIOLOGY

The disorder is considered to be due to a genetic anomaly. Widderburn described 10 anhidrotic male patients in a Hindu family. The exact mode of transmission of the full anhidrotic syndrome is a subject of controversy. Wechselman[5] concluded from his studies that the defect is transmitted as a sex-linked characteristic in the same manner as hemophilia, by an unaffected female conductor to male members of the family. Goeckerman[6] however, reported a case in a female patient and stated that the condition is not always recessive in females. Congenital syphilis, endocrine dysfunction and fluorine poisoning were among the causative factors formerly accused but not proved.

PATHOLOGY

Most observers are agreed that the pathologic process is probably an aplasia and not an atrophy, because degenerative changes in

*From the Pediatric Department Abbassia—Faculty of Medicine—Cairo, Egypt—U. A. R.

the ectodermal structures have rarely been seen in tissue sections. The majority of those who have studied excised epidermis from anhidrotic patients have reported either total absence of sweat glands or the presence of rudimentary fragments of non-functioning glands and ducts. However, evidence of anhidrosis based on single or multiple biopsies is incomplete even though the sites include the palms and soles. Felsher[8] observed that some few sweat glands may be present and functioning in these patients and by applying a starch iodine mixture to the skin of his cases he could see small areas where sweat was being produced when the skin was exposed to heat. He therefore, suggested that the term hypohidrosis rather than anhidrosis be applied to the condition Sunderman[9], in a similar study, came to the same conclusion.

Histologically, the epidermis is usually thinner than normal and there is reduction in the width of the cutis but the collagen and elastic fibers as well as the blood vessels are normal in appearance. Sunderman[9], in the study of biopsy material from the axilla of 2 patients, reported normal apocrine glands but absence of eccrine glands. Helweg-Larsen and Ludvigsen[10] found that the number of sweat glands was much reduced and those present were hypertrophic. Biopsies from the thin dry mucous membrane of the mouth and upper respiratory tract have revealed hypoplastic changes in the epithelium as well as in the underlying glands.

Since only few reports of definite abnormalities in the nervous system in anhidrotic patients exist, it seems probable that the pathologic process resulting from the defective gene or genes begins to affect the development of the epidermal structure during the second fetal month[1]. The lens may or may not be involved as it undergoes separation from the ectoderm during this time.

CLINICAL CHARACTERISTICS

Patients have a characteristic facies, with high wide eyebrows, prominent frontal bones, depressed nasal root and bridge, thick lips with radiating furrows about the mouth. The skin is usually soft, thin and feminine, with total or almost total lack of sweat glands functioning under all environmental conditions. According to Stiles and Weir[13] one cause of obscure fever may be ectodermal dysplasia of anhidrotic type. Sebaceous gland activity is usually depressed to a variable degree but apocrine function may remain normal. Mammary glands may be normal, deficient or even absent[11]. Delayed appearance and marked deficiency in the

development of the scalp hair, eyebrows, eyelashes and lanugo are frequent. However, there is often little uniformity in the degree of development of hairs beginning at or after puberty, so that the beard is frequently normal, while axillary or pubic hair is either scanty or absent. Nails are often normal but they may exhibit slow growth, longitudinal furrows or slight atrophy. Delayed dentition and hypodontia regularly occur in these patients. There is not only deficiency in the number of both the deciduous and permanent teeth but also the teeth present are usually abnormally placed and their normal anatomic markings are frequently absent. Complete anodontia accompanying anhidrosis has been reported[1]. Erupted teeth, particularly the incisors and bicuspids are usually widely separated, peg-shaped or conical, darkly pigmented and fragile. Usually the development of the maxilla and mandible is in proportion to the erupted teeth, as it depends on the amount of resulting mastication made possible.

Occular defects may be in the form of congenital cataract or chorioretinal disturbances[12].

Many authors have reported defective function of the lacrimal glands, and many of the patients have chronic rhinitis accompanied by foul nasal discharge and diminution of olfactory sense. Dysphagia, hoarseness of voice and intermittent complete aphonia have been reported. Although numerous anhidrotic patients are mentally inferior, it is commonly believed that the same genetic defect is not responsible for both of these abnormalities.

Treatment is only symptomatic. Artificial dentures should be fitted early in anhidrotic children with hypodontia to help the development of the mandible and the maxilla. Plastic repair of the saddle nose deformity will do much to improve the patient's facies and general morale. Mortimer, Wright and Collip[14] have reported favorably on the results of using estrogenic hormone therapy incorporated in a nasal spray for chronic rhinitis and ozena.

In view of the normal longevity enjoyed by the patients affected with anhidrosis, these measures, although not curative, are certainly important in making life more pleasant.

CASE REPORTS

Case 1. S. M., a male white child, aged 5 years, was brought to hospital for deficient teeth formation and deficient hair on the outer half of the eyebrows. The mother noted that the child never perspired and is subject to chronic rhinitis and recurrent diarrheas.

The history revealed that in his first two years he used to suffer from recurrent bouts of fever, but only during the hot summer time. The parents stated that numerous diagnostic procedures were undertaken during these bouts without finding any evidence of infection and that various antibiotics were administered without controlling the course of the fever.

Regarding development, the child was apparently normal at birth. He could sit, stand, walk and talk at the usual time. However, he was always much underweight and had delayed and deficient dentition. The first deciduous tooth erupted at the age of 3 years and when first seen had only 9 teeth. On the other hand, his intelligence was well above the average.

Fig. 1 Shows the poor general physique of the child.

The child is the second sibling of his parents who are relatives. The first, a male, was born apparently normal and died of broncho-pneumonia when 20 days old, and the third is a healthy female child, 3 years old. No other members of the family were found to suffer from the present anomaly.

Examination of the child revealed that he is of poor general physique, (fig. 1) weight 13 kg. and height 39 inches, i. e. he is much below the average for his age. The scalp hair is diffusely scanty, fair in color and fine in texture. The lashes are normal on the upper lids but sparse on the lower. The outer half of the eyebrows on both sides is absent, (fig. 2). The root of the nose is depressed but there is no widening or saddle nose deformity. The lips are thick (fig. 2) with radiating furrows around the mouth. The alveolar processes are poorly developed and only 9 teeth are present; 2 incisors, 2 canines and 2 molars in the upper jaw, while in the lower jaw there are 2 incisors and one right molar only. The teeth are widely separated (fig. 3), the incisors and canines are peg shaped, but all of them are apparently strong.

The eyes and the fundi are normal and the senses of smell and taste intact. The voice is also normal.

Fig. 2 Shows sparse lashes on lower lids, absent hair on the outer half of the eyebrows and depressed root of nose.
Fig. 3 Shows deficient number of teeth, being widely separated.

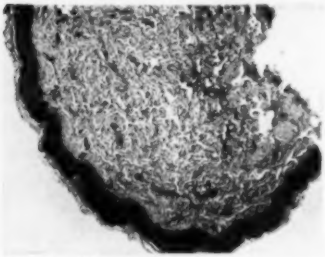

Fig. 4 Microphoto of a biopsy specimen from the skin of the palm.

The skin of the face, trunk and thighs is soft, thin, fine and feminine and always dry. The skin over the legs simulated congenital isthyosis. The nails are normal.

The remainder of the physical examination revealed no abnormalities.

Routine examinations of the blood and urine gave normal results, as did the fasting blood sugar, serum calcium, phosphorus and potassium. Blood W. R. was negative in the child and in the parents. The ECG showed no abnormality but the EEG showed paroxysmal discharges of frequently repeated wave and spike 3/second simulating those of petitmal. However, no history of petitmal in the child or in the relatives could be obtained.

In serial sections from two biopsy specimens removed from the skin of the palm and of the forearm, the epidermis and cutis were thinner than normal and no trace of hair follicles, sebaceous or sweat glands could be found (fig. 4).

CASE 2

I. M. is a male patient, was 7 months old when first admitted to Abbassia children's hospital on 15/4/1960. He was referred to one of us from a general practitioner, with the complaint of fever of obscure origin.

Family History: The infant is the fourth sibling of his parents. Parents were unrelated and both are middle aged and in good

health. Their first child died at 9 months of age after suffering from a prolonged fever that could not be diagnosed. The second child died at 2 years of age, also after recurrent attacks of fever of unknown cause. The third is a female, now two years old and is enjoying good health.

Developmental History: The child was born at full term, after a normal labour. He looked normal at birth. He is now eight months old and has not erupted any tooth and so may be considered to have delayed teething. Apart from this, he has reached other physical and mental milestones for his age normally.

Fig. 5 Shows thick lips, absent hair over outer half of the eyebrows and scanty hair over the scalp.

Present History: Twenty-four hours after delivery, the patient had a rise of temperature which was sustained for a few days and then dropped spontaneously. Two months later he had another attack of fever and since then his temperature is up and down so that it is commonly above the base line. Laboratory investigations revealed a normal blood picture, sedimentation rate and urine analysis. Blood culture was negative and the fever did not definitely respond to antibiotics or sulfa. The mother noticed that since birth the child never perspired. She also complained that he was suffering from a chronic nasal discharge, rather tenacious in character, and that sometimes dry plugs of secretion block his nose.

Examination: The child (fig. 5) is alert and apparently of normal mentality for his age. He is 6.5 kg. in weight (i. e. about 2 kilos below normal weight), has a normal height (63 cm.) and a normal circumference of the skull (41 cm.). His temperature is 38.0 °C. but the pulse and respiratory rate are within normal. The hair over the scalp is very scanty and almost absent from the occipital and temporal regions. The few hairs present are fair in color and fine in texture. The eyelashes are scanty over the upper lids and almost absent over the lower ones. The hair is absent from the outer half of both eyebrows and is scanty on the inner halves.

The root of the nose is depressed and the lips are thick (fig. 5). The anterior fontanelle is 1½ fingers breadth. There are no teeth. The eyes and fundi are normal and the sense of taste is intact. The skin covering the face, trunk, thigh, arms and legs feels soft, thin, fine and feminine, and is always dry. Examination of the heart, chest, abdomen and nervous system showed normal findings.

Laboratory investigations of the blood and urine, as in the first case, revealed no abnormality. Likewise, the ECG, EEG and the X-ray of the skull were all normal.

The report on serial sections from biopsy specimen taken from the palm and the forearm was as follows: The epidermis and cutis are slightly atrophied. There are no appendages; hair follicles, sebaceous or sweat glands.

Acknowledgement: The authors express their thanks to Dr. O. Attia and Dr. Kamal of the Pathology Department, for their two reports on the skin biopsies.

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Poison Control — DDT Intoxication

HAROLD JACOBZINER, M.D.*
HARRY W. RAYBIN, M.S.†
New York

DDT is still one of the most widely used insecticides and is a common household product. Chemically, it is dichlorodiphenyltrichloroethane. In those household sprays containing DDT, its concentration is usually from 2 to 5 per cent, frequently accompanied by other insecticidal agents.

Fortunately, DDT has a wide margin of safety, particularly in the powder form and in the aqueous suspension, since it is not too readily absorbed from the gastro-intestinal tract. Fats, however, enhance the absorption of DDT. It is very likely that many of the toxic manifestations reported may actually have been due to the solvent rather than to the DDT itself, particularly where there are accompanying pneumonias. As a 10 per cent dust, DDT was widely used by the Armed Forces with an excellent safety record.

The mode of action is not definitely known, but the DDT acts chiefly on the central nervous system. While most of the cases reported are asymptomatic, stupor, convulsions and paresthesias have been reported. Complete recovery generally occurs within 24 or 36 hours following an ingestion. While kidney and liver damage has been reported in animal ingestions, such manifestations have not been reported in human beings.

*Assistant Commissioner for Maternal and Child Health, Department of Health, City of New York.
†Technical Director, Poison Control Center.

The earliest signs and symptoms following acute ingestion are nausea and vomiting which may be followed by general malaise, headaches, stupor and convulsions. Tremors of the eyelids, head and neck and ataxias have also been reported.

TREATMENT

In minor ingestions of kerosene solutions of DDT, it would probably be wiser not to recommend gastric lavage due to the greater hazard of an accompanying pneumonitis. As a prophylactic against central nervous system manifestations, phenobarbital is recommended. Fats are contraindicated because they will enhance absorption. Saline cathartics have been recommended, but some of our consultants doubt the efficacy of this measure in most poisonings.

One hundred and four (104) cases of DDT poisoning have been reported to the New York City Poison Control Center since 1955. Only one fatality occurred in this series—a 1½ year old female who accidentally ingested an unknown amount of DDT preparation. The symptoms on admission to the hospital were cyanosis and stupor and, in spite of all attempts at therapy, such as gastric lavage, oxygen, caffeine sodium benzoate, coramine, penicillin and calcium gluconate, the child expired 4 hours after admission to the hospital. In the remainder of the cases, the most prominent findings were nausea and vomiting, and many incidents were entirely asymptomatic.

It may be of interest to cite a case in which DDT was suspected as the incriminating agent. It was not possible to obtain precise information relating to the mode of occurrence. We are indebted for this information to Dr. Doris Milman, formerly connected with the Pediatric Psychiatric Unit, Downstate Medical Center, State University of New York.

This child, a 6 year old male, was seen at the Psychiatric Unit at Kings County Hospital because he was considered to be a behavior problem at home and at school. Some of his actions appeared bizarre, such as locking himself in closets and so forth. The positive findings on examination were based on Stanford-Binet (Form L) and Rorschach Tests, Thematic Apperception Test, and drawings. The psychologist's report states that the patient was

". . . fairly cooperative throughout the test session. However, he did not relate to the examiner very well, would concentrate on test and play materials which interested him but had to be

coaxed to do some of the tests. It was sometimes difficult to discover whether he failed test items (such as counting) because he was unable to do them or because he was not interested in the examiner's game and was making up his own.

"His I.Q. on the Stanford-Binet was 93, which is in the 'average' range. The two items failed at the six year level were counting and vocabulary. Both his mischievous manner and the report that he counted well in the conference interview suggest that he failed because he was not really cooperative. His failure on the vocabulary test may well be due to the Spanish speaking home in which he lives. His mother, who appears fairly intelligent, did not know any of the simple English words which Charles failed (e.g., tap, puddle). His visual-motor coordination was appropriate for his age and he was able to pass a test at the 7 year level in which he was required to detect and explain absurdities in pictures.

"His figure drawings were of monsters with elongated bodies and many fingers. After some coaxing he drew a person—a woman with a tail and a baby. These drawings suggest that Charles has a good deal of body image confusion which is anxiety arousing and that he uses avoidance and projection in the attempt to defend himself against this anxiety.

"His Rorschach was highly perseverative in content but flexible in the elaboration of concepts and choice of location. Once again, there was an emphasis on body image problems, e.g., a monster with no head; broken bears. His responses suggest that he tends to become preoccupied with certain topics, to be unable to shift his attention and interest once his anxiety is aroused and to project his anxiety onto the outer world which he then perceives as irregular and distorted.

"His thematic apperception test (T. A. T.) stories consisted of very sketchy descriptions of the pictures. There were some distortions in which little animals (e.g., chicks) were seen as larger, and more dangerous ones (bears), but for the most part his descriptions were accurate and fairly detailed. The only picture for which there was any elaboration was the one in which the mother dog is 'beating the baby for doing something in the toilet', suggesting some guilt and preoccupation with his toilet activities.

"In summary, Charles is a boy of at least 'average' intelligence who shows considerable emotional disturbance. He does not re-

late well to others but is self-preoccupied and concerned with his own fantasy life, in which projection plays a large role. A good deal of anxiety, centered on body-image problems, is reflected in his view of the world as full of frightening and distorted people. Diagnostically, the disturbance appears to be of a prepsychotic nature. This may well be related to the episode of DDT poisoning when he was one year of age, but organic features are in themselves not evident in the record at this time. Charles appears to be sufficiently disturbed at this time to require some form of psychotherapeutic treatment."

Dr. Milman's diagnosis was that of chronic brain syndrome possibly due to DDT intoxication.

In the popular lay literature and as reflected in calls to this Center, DDT is considered to be one of the most hazardous of household products. This evaluation is not confirmed by the medical literature and our data. The widespread presence of trace amounts of DDT in food products and its accumulation in human fat tissue is probably the basis for this apprehension. The medical significance of its presence in fat has not been evaluated. There is also widespread condemnation and apprehension among wild life conservationists on its suspected deleterious effect on avian and mammal population. Area spraying for insect control by governmental agencies has been a source of unresolved controversy.

While not very toxic, careful storing and handling of DDT products is recommended.

125 Worth St., New York 13.

(This is the second of a series of papers by Dr. Jacobziner).

Clinical Conference

Subdural Hematoma

Morristown Memorial Hospital.
Morristown, N. J.

Catherine E. Spears, M.D., *Pediatric Neurologist, Presiding*
Franklin Reed, M.D., *Roentgenologist*
Bayard Coggeshall, M.D., *Attending Pediatrician*
Henry Liss, M.D., *Associate Neuro-surgeon*
Irvin Cleveland, M.D., *Assistant Pathologist*
Malcolm Plum, M.D., *Attending Surgeon*
Elizabeth Eken, M.D., *Attending Neuro-phychiatrist & Director of Electroencephalogram Department*
Clyde Bowers, M.D., *Attending Physician, President of Medical Staff*

Dr. Spears: We have two youngsters on whom the diagnosis of subdural hematoma was made and on whom operations were done with good results. I have brought one of them who is on a rehabilitation program at the Children's Country Home in Westfield, N. J. I'll let you see her now and see how well she is progressing so that the station wagon will not be kept waiting too long and so that she will not miss her therapy.

This is Debbie. "Debbie, these are the doctor friends of mine whom I told you about. Could you show them how nicely you can walk with your new braces and weighted carriage?" This harness you see around her upper trunk is just a safety precaution. I am not supporting her with it. As you will notice, we have the carriage weighted so that it is not too easy to push along. Debbie has trouble holding on with her left hand but once her hand clasps onto the handle, she does very well.

"Come on, Debbie, let's walk across the room. That's fine. Now let's show the doctors how you can walk with your new crutches."

As you can see she has trouble manipulating her left tripod or crabtree crutch. She is developing enough balance now that she can almost get along with only her right crutch. "Let's show them Debbie." "Now, one more thing, could you talk for the doctors, Deb?"

"No, Docca Pears, I'm too tired" said Debbie.

"All right sweetheart, now you may go back. Thank you for showing off so nicely for us. I'll see you tomorrow."

Debbie was admitted to Morristown Memorial Hospital for diagnosis and treatment.

We got x-rays of her skull and x-rays of her hips, all of which were normal. We got an electroencephalogram which was abnormal, showing a depression of waves over the area where we thought she had a subdural. Dr. Eken will present these findings and Dr. Reed will present the x-ray findings.

DR. EKEN: Her blood work, blood chemistries, urinalysis were normal. After getting the skull x-rays and the electroencephalogram we then proceeded to do subdural tappings through the anterior fontanel. We withdrew 50 to 100 cc of xanthrochromic fluid from the left side and 10 cc from the right side. In getting the laboratory reports on the subdural fluid, the protein was 40 and 6 to 7 lymphocytes, which is within normal limits. We did multiple tappings on this youngster and still did not seem to get any reduction in the amount of fluid we were draining off. It always seemed to recur. After doing this daily for three weeks, and after one of the tappings we put air into the subdural space and took x-rays and found it went down between both hemispheres instead of going where we thought it should go. Then Dr. Laudig examined the youngster, did a pneumoencephalogram which showed unequally dilated ventricles, but there also was an area over the left parietal region that showed the cerebral cortex to be depressed and looked as if we either had something there or that the brain had not expanded. The patient then contracted chicken-pox, so we had to transfer her down to our contagion unit. After recovering from the chicken-pox, we then retapped her and found that we had over 100 cc of fluid, more fluid than we had obtained in the beginning. At this time we then decided that we had to go in and take a look. Burr holes were made by Dr. Laudig and a hygroma was found and removed. It was the size of an orange. Our job did not end when we removed the hygroma and the sac. Our job still continues in habilitating this child to see whether we can have as near normal a child as we can get. Now she has been psychologically tested and the psychologist's opinion is that she is normal mentally. She has now reached the stage of walking with braces with a weighted carriage to give herself a little balance because she still has trouble using her left hand. We have just graduated her to tripod crutches or what we call "crab" crutches, if you are more familiar with that term. She is doing very nicely as you can see. When we first started to habilitate her, we had

to do quite a bit of muscle re-education, stretching, trying to get her to use muscles she never used before. And, of course, the biggest thrill was to get her to sit up and hold her head up. Then, of course when she got standing balance, this was even more of a thrill, and I think for those of us who have worked with her, it's quite a treat to see her walk out of this room today under her own power. Dr. Reed, would you please show us Debbie's x-rays?

DR. REED: The first films taken on 4/17/57 show the skull to be of normal size and shape. There is no sign of increased intracranial pressure, abnormal calcification or fracture. The sella turcica is not remarkable. There is no radiographic evidence of subdural hematoma as mentioned in the history. The second set of films taken on 5/17/57 are after subdural taps had been performed. AP film as well as cross-table films with the brow up and left side up shows a collection of extradural air near the vertex and this shifts with change in position. No masses or fluid collections are suggested and there is no evidence of absent or atrophic brain substance.

The pneumoencephalogram taken on 5/22/57 shows good filling of the ventricles with definite dilatation of the right lateral ventricle as compared with the left. The 3rd and 4th ventricles are not dilated. The sulci over both cerebral hemispheres are markedly widened and the brain substance is definitely diminished. The findings indicate a rather severe degree of cerebral atrophy.

DR. SPEARS: Thank you, Dr. Reed.

A discussion has been going on among us as to the value of an electroencephalogram. Many times it has been felt that an electroencephalogram has no value until a youngster is two years old or more. We are finding that with a number of children on whom we do these tests from three months of age on, the electroencephalograms are of great value to us. We have been able to pick up (Dr. Eken has, rather) a depression of brain waves over the area where there is an abnormal collection of fluid.

We have been able to confirm this by subdural taps—by removing the fluid we have been getting changes on the brain waves after six months—that is six months after we have done the tapping. On Debbie, her electroencephalogram was reported as an abnormal record because of a left asymmetry with a reduction of voltage especially on the left and reduction of alpha activity plus an in-

crease in beta. Impression: Abnormal EEG compatible with a diagnosis of a focalizing lesion on the left. This will be discussed by Dr. Eken later.

Dr. Coggeshall has the next youngster whom we feel brings out a good point on subdural also.

DR. COGGESHALL: This child was a little younger. He first came to my office when he was about ten months of age. He was one of twins weighing 3 lbs. 6 oz. and his twin sibling, who was born first, weighed 5 lbs. 4½ oz. There was nothing particularly remarkable about the birth nor about the immediate post-natal period. The baby was put in an incubator and did have oxygen for two or three days and apparently did not require it afterwards. His course was essentially uneventful. On coming into the office at eleven months of age, the chief complaints were merely that the mother was worried about his being slower than his twin. Primarily, the baby made no effort to sit and could not sit when propped. There has been some congestion in the chest all the past winter. The baby threw up frequently, particularly when straining to have a bowel movement, but also in between times. He was fairly good natured but tended to be a bit on the irritable side and cried easily. These were the main general non-specific complaints that the mother had. Any one of them was not diagnostic. On examination the baby appeared much younger than his age. The bone age revealed 7 months, whereas the chronological age was 10 months. The head was the point of interest. It did have an oblique capitas, which by itself is not diagnostic in subdurals, but there was some fullness in the fontanels, and in spite of the oblique capitas, there looked to be a little more bossing especially on the right side than on the left, so I just felt that the baby was not doing well. Dr. Spears having indoctrinated others into the possibility of subdurals, I admitted him directly to the hospital, with the feeling that subdurals should be done, and they were done. I am going to skip a little bit here and Dr. Spears will fill in, but just for interest's sake, I did measure out a mean weight chart here. The baby was way below in the two readings I got. One was actually before hospitalization and the other was immediately after. This baby is way below its channel, both in weight and length; whereas its sibling is within normal range in its own weight channel.

There are too few readings to really dwell on, except that here are some of the basic readings, and the interesting thing in the

next few months and years would be to chart this baby out and see if his progress doesn't come back and begin getting toward the normal channel of growth and development, so that might help you report on it at a later date. The head size, just for comparison, on the day of admission was 17 inches compared with a chest of 15½ inches. Following discharge, two months later, the head had grown only a quarter of an inch, 17¼ inches, compared to a chest which had grown an inch, 16½ inches. So that the treatment that Dr. Spears and Dr. Liss will fill in on apparently had some compensating effect and we now see the head size coming back to a size commensurate with the child's stature. The electroencephalogram was done and showed an abnormal reading with right frontal accentuation. The spinal fluid was negative, protein was 24—there were only three cells and the subdural fluid had a protein of about 28. Colloidal gold curve was normal. The blood chemistries were normal, the urines were normal and the bone age I have mentioned. I'll let Dr. Spears take it from here.

DR. SPEARS: The electroencephalogram showed—Alpha-none noted; Beta-15-20 cycles per second, maximum voltage 20 microvolts, small amount in frontals and temporals; Delta-0.1-6 cycles per second, maximum voltage 270 microvolts. 94% in all leads.

A markedly abnormal record with some few short runs and bursts of 3-5 cycles per second activity. It is of poor electrical quality and is disorganized even for a very young child. A right asymmetry is noted and a right frontal and occipital accentuation is seen.

When we felt we had confirmed, or almost confirmed, the diagnosis of subdural hematoma I went ahead and again did subdural tappings through the anterior fontanel. This baby was a bit difficult to do because he had the marked bossing on the right side, and the fontanel was a little smaller than Debbie's. We had to go through a suture line on the right side, and interestingly enough, we got fluid coming out, but not as much as one would think with his clinical findings. I don't know why, I just went ahead and put the needle in the other side, which I do routinely, but I left the needle in place on the right side, and the needle in the left side acted as an air valve, so that fluid just dripped out like fury from the right side, and we found that on subsequent tappings we had to use a needle on the opposite side to act as an air valve, like we do with our intravenous infusions.

We found, also, that he did have a communicative type of hematoma and with markedly repeated taps, we still couldn't dry this baby up either, so we placed air into the subdural space again and found that it was collecting over the frontal lobe, and that the frontal lobe was not expanding. We have those x-rays here also. Dr. Liss do you want to take it from here because it was at this point that we decided you should examine this youngster with the idea of operating on him.

DR. LISS: I think if we show the x-rays first it will make it a little more graphic. These were the first studies that were done on 4/9/59 and show a prominence of the frontal bones and a rather deep vertical diameter to the skull. As regards size, it is at the upper limits of normal. There is no sign of increased intracranial pressure, abnormal calcification or fracture. The sella turcica is grossly normal.

On the second set of films taken on 4/26/59, air has been introduced into the subarachnoid space over the cerebral hemispheres through needles inserted through the frontal surture on either side of the midline demonstrating cortical atrophy of both frontal lobes and probably the right parietal as well. Now here on 4/29/59 you can see there is an even larger collection in the frontal region than there was in the earlier studies. These show a large cystic area in the frontal region with evidence of frontal lobe atrophy. On this study the changes are largely on the right side. Convolutions are wider again indicating a cortical atrophy. These are post-operative films which show the flaps. This is one of two recent cases. The principles involved have been open to debate now for several years. The one school of thought holds that these children should have multiple taps for an indefinite period and sometimes set 30 to 90 days as a period. Presumably by repeated tappings of this collection of fluid which has a higher protein than the cerebral spinal fluid, and therefore attracts the spinal fluid to it and recurs daily, the brain will expand, the size of the sac will decrease, and hopefully, eventually the two membranes, the one that adheres to the surface of the brain and the one that adheres to the inside of the bone, will come together, and by sticking together, will obliterate the space. The second school of thought contends that if, after a short period of time, you do not see a decrease in the total quantity of fluid with your daily taps, the child deserves an exploration. Burr holes were done and an attempt to strip the membranes through the burr holes. Most probably, however, these children need to

have a full-fledged craniotomy because of the membranes, and you can see in the x-rays here that the sac and the membranes, of course with it, went down over the anterior pole of the frontal lobe and even beneath the frontal lobe as well as across the surface of the brain. Very often, as in this picture, it's a bilateral collection of fluid. In the baby that we have just shown you, the unilateral bossing on the right side showed a larger sac to be on that side. Now a group of neurosurgeons in Hartford, Conn. have been injecting radioactive iodides into the system, and tapping the spinal fluid and tapping the sac in an effort to determine the ratio between the two systems. If they can find a ratio above a certain arbitrary limit, which they have set, they feel that this spinal fluid situation is not going to respond to taps, and, therefore, they can decide earlier that a craniotomy should be done. What we did was presume that this was excessive bulging and performed a craniotomy in this area. A circumscribed portion of the frontal bone was removed, and the sac was seen to extend from a very thin layer with the brain beneath it. Now, because the sac was adhered to the bone, it would not collapse down on the brain, and the second thought was that the portion of the sac that was adherent to the cortex constricted the growth of the brain so that expansion to fill the bony cavity was limited. This presumably accounted for some of the neurological abnormalities in these children. It is necessary to reshape the skull so that approximately a half inch of bone is removed all the way around and the bone at this age is not much more than a ping pong ball in thickness and can be shaped with a heavy scissor. We removed and rewired the remaining portion of bone to the skull. Now, on the second child, just about the same time, looking across the midline, it would seem that the brain sat away about half that distance, and so it was necessary to reshape both frontal lobes and that is a little more extensive than we like to do.

DR. SPEARS: Thank you Dr. Liss. We just selected two of the youngsters that we have been doing in the last few years. We seem to run a series of them. We feel that we are doing a good job in giving these youngsters a chance of becoming and acting normal in our society. Now, there are two points I should like to bring up today, if I may hound you a bit about it. If you had seen in your office, a youngster who was not developing as fast as the parents think the child should, especially if they have other children to base their judgment, and their comment

upon, don't just pooh pooh them and say "He's just a bit slower than Johnny or Mary." Take a good look at his head and see if there is an asymmetry of the head, especially the frontal bones. You will also see that most of the time the fontanel is open, not dilated, but not filling in as quickly as it should, and you can see the scalp veins dilated along the suture line on the sides of the head. If this child was not sitting or holding his head as well as he should, then think about a subdural. The other point I should like to make is that the literature says, if you can remove subdurals before the child is nine months of age, you can get almost 100% cure, in that the child will be normal. For every month that you wait after nine months, there is that much more possibility that the child will be retarded. Now, by the same token, if you had a youngster who was using one side of his body less well than the other side, we think of subdurals for them, even though you call them cerebral palsied.

DR. CLEVELAND: I want to say something about the pathology. What we find grossly, is a thin-walled sac. Usually we get it in segments. In situ, it is usually discoid, flattened, greyish in color, contains either late blood or xanthochromic fluid, sometimes in the wall there are little areas of yellowish discoloration due to heavy concentration of blood pigments in those regions. On the microscopic section it is very much what you see in a hernia, it is a fibroplastic mass, a lining smooth, one cell in depth, formed by fibroblasts, a lot of newly formed capillaries with quite a prominent endothelial lining cells. One thing that I think is unusual in the case that Dr. Liss spoke of, is where there was attachment to the arachnoid surface of the brain. Usually these are either extradural or subdural with attachments to the dura and with no attachments to the arachnoid

DR. PLUM: What is the incidence?

DR. CLEVELAND: I do not know what the incidence is. I know they are pretty much confined to very early life and very late life. This period we had today is associated with birth trauma and the bleeding from the wall veins in the dura.

Actually the sac does not develop until after the fifth week. The larger hemorrhages are earlier symptoms, and these people are opened sooner. You don't have complete myelinization in a newborn so you do not get the symptoms in a newborn as you do in an adult. If you have a mass hemorrhage from a large

vessel, you have an early death, of course. With these children it is a slow seepage kind of thing. Actually, the real space-taking lesion occurs once the sac is formed. This membrane, this sacular wall, is a semipermeable membrane and by osmosis it still can get larger and therefore has to be emptied from time to time or it continues in size.

DR. COGGESHALL: I should like to make one remark as a follow-up—that little baby, after the subdural tap and craniotomy, began to sit up while he was still here in the hospital. We began to get immediate results.

DR. SPEARS: Dr. Eken, I believe we have stolen all your thunder but would you please tell us what you feel about the electro-encephalogram?

DR. EKEN: I think it should be said that, in evaluating an electroencephalogram where the presence of a subdural hematoma is suspected, one usually notes three stages of change in the record. These stages are represented by 1) a marked increase in the voltage and amplitude of the record; 2) a distinct depression in the voltage and amplitude of the record, or 3) a complete absence of electrical response because of the short-circuiting of the electrical output of the brain by the presence of a collection of fluid between the cortex of the brain and the electrode. Dr. Henry Jasper demonstrated that a great deal in the interpretation of these records is dependent upon the depth of the fluid collection present and the corresponding distance of the electrode from the cortex. Naturally, this interpretation, in whatever stage it may be, must be evaluated in the light of a good history, since other types of trauma frequently produce a similar situation. After a longer interval between trauma and record when a certain amount of consolidation has taken place, or organization of the fluid collection, a combination wave form may appear, this being a slow wave with superimposed or interspersed sharp wave activity. After sufficient time has passed so that the sac enclosing the hematoma has had sufficient opportunity to depress the cortex away from the recording surface of the electrode, i.e., the scalp surface, a flattened record results. The number visible here at the top of the page will act as a marker for your observation of the line immediately beneath which is the left frontal electrode tracing which appears markedly depressed.

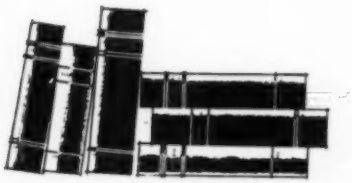
You can see that these tracings are considerably smaller in amplitude, voltage and frequency. The line immediately above the left frontal electrode is the right frontal electrode, and it is easy to see the difference in the voltage by comparison. You must remember that in a child of this age, all activity is of greater voltage and amplitude and of considerably slower frequency than that seen in an adult record. It is also possible to have, as Dr. Liss mentioned in his remarks, a situation of bilateral hematoma with increased voltage on the side opposite the greater lesion.

DR. PLUM: Dr. Spears I think you should stress how much time you spend habilitating these children and that the treatment does not stop with the removal of the subdural sacs.

DR. SPEARS: I thank you, Dr. Plum, for bringing up that point but that would take another hour to discuss. We will do that at another time. I think the most important thing is the team approach which you see we have in this hospital today.

We now have a new Child Evaluation Center here in Morristown connected with this hospital. The children we would like to have sent to us are those you feel we could help you with in making a diagnosis as to why they are retarded, whether it is a mental retardation or a physical retardation. The children that come to us over there have to be referred to us by a physician. When the referral is received, a history form is sent to the parents who complete it and return it to us, then they will be interviewed by our full-time psychiatric social worker, who will then discuss the particular referral with Dr. Coggeshall and myself, and we will go ahead and examine the children from a pediatric and neurological point of view. All of these youngsters will get an electroencephalogram, an x-ray of their skull, x-rays for bone age, a complete endocrine work-up as well as blood chemistries and a psychological evaluation. Then the findings will be presented at a team conference and discussed. These findings will be sent to the referring physician with suggestions as to what treatment the child needs as far as we can tell and also where you can get it in our community.

DR. BOWERS: I'd like to thank all the participants for a very excellent presentation this morning. It just proves once more what we have contended for a long time—mainly that this hospital continues to do good and important work. Thank you very much.



. . . Books

Edited by

MICHAEL A. BRESCIA, M.D.

BONE AS A TISSUE. Edited by Kaare Rodahl, M.D., Jesse T. Nicholson, M.D., Ernest M. Brown, Jr., M.D. Price $16.00. Blakiston, McGraw-Hill Book Co., Inc. 1960.

This excellent little book summarizes our knowledge of bone metabolism. Sixteen short monographs by acknowledged experts in the field are broadly subdivided into four sections: Osteoporosis, Calcium Metabolism, Ultrastructure of Bone and finally Vitamin D & Parathyroid Metabolism.

Here in a nutshell are the facts and some of the theories of this rather complex subject, and while complete and thorough the book has been written and edited in a manner that will appeal to those not intimately conversant with this still incompletely understood field.

It is to be recommended to all who have more than a superficial interest in the disorders and diseases of bone, do they but recognize that the very nature of the subject requires thoughtful reading rather than brief skimming, study rather than mere perusal.

JOHN D. LE BOUVIER, M.D.

CEREBRAL PALSY AND RELATED DISORDERS. A developmental approach to dysfunction. By Eric Denhoff, M.D. and Isabel Pick Robinault, Ph.D. Cloth. Price $12.00. Pp. 421. New York. McGraw-Hill Book Co. 1960.

A physician and a psychologist, both specializing in the study and rehabilitation of the physically handicapped have combined to bring not only their own experience and point of view into a co-ordinated whole but also the experience and therapeutic approach of related specialists such as speech therapists, physical therapists, occupational therapists, speech-hearing therapists, social workers and the related medical specialties of pediatrics, immuniology, psychiatry, encephalography, orthopedic surgery, as well as educators. Obviously, to integrate all of these areas of

knowledge and special points of view is a most difficult task which has been skillfully done.

The approach to the problem emphasizes functional impairment, not in the static sense but in the changing development of the child. Diagnosis is not merely in terms of type and extent of brain damage or disorder but in terms of the extent function has been impaired and what therapeutic measures may be instituted to bring the child up to his optimum functioning. The importance of having the child's care integrated is emphasized. The team approach of the Meeting House School, Providence, Rhode Island where the practice is employed testifies that the developmental and functional approach is not just an idealistic concept but can be a reality.

HELEN THOMPSON, PH.D.

BLIND CHILDREN IN FAMILY AND COMMUNITY. By Marietta B. Spencer, photographs by Frank Agar, Jr. and Carol Safer. Cloth. Pp. 142. Price $4.25. Minneapolis: University of Minnesota Press. 1960.

Blindness is not so common in young children that people generally know the special difficulties a child so handicapped encounters. Many medical practitioners and even pediatricians will admit to limited knowledge in this respect. Miss Spencer's book, richly pictorial with accompanying text, is most instructive to both lay and professional groups not specializing in the care of the blind. To the parents of a blind child it will afford guidance and encouragement not merely to accept the child's limitations but to understand his special problems and to foster utilization of the abilities he does have.

Vision is an important stimulus in the early years for both motor and social responsiveness. Lack of vision is therefore a handicap in these areas as well as in seeing. It is important that parents be aware of ways in which the child can be motivated to walk and run about with the security normal for the seeing child. While Miss Spencer emphasizes the similarities of the needs of the blind and seeing child she clearly shows the blind child's needs can be met in special ways. The book is of great value to parents and doctors alike. It can even serve as educational reading matter in the waiting room.

HELEN THOMPSON, PH.D.

Authors' Summaries...

Brown, E. B., and Botstein, A.: THE EFFECT OF GAMMA GLOBULIN IN ASTHMATIC CHILDREN. (New York State Journal of Medicine 60:2539 Aug. 15, 1960).

Twenty-nine children, ranging in age from one year through ten years, with a history of severe asthma of at least one year duration occurring mostly in the fall and winter following febrile upper respiratory infections, were treated with gamma globulin. Gamma globulin was injected intramuscularly every three weeks in doses of 0.15 to 0.2 cc. per pound of body weight. The gamma globulin was supplied in 16 per cent solutions by the American Red Cross.

Twenty-three patients (79.3 per cent) responded favorably, 14 being completely asymptomatic, while 9 suffered rare mild wheezing of a few hours duration. Only 6 patients (20.7 per cent) continued to have asthma. Unfortunately, 3 of the 6 patients did not have a trial on the increased dose (0.2 cc. per pound). Eleven of the 23 children responded successfully only after the dosage was increased.

The successfully treated 23 children appeared to benefit substantially from gamma globulin therapy. The upper respiratory infections were reduced drastically in number and severity in this group. The best results were obtained in young children below seven years of age with a relative short duration of asthma, whose skin tests were negative to common inhalants.

We recommend gamma globulin treatment for children with a history of asthma following upper respiratory infections. In children who have a history of additional sensitivity to common inhalants, the usual hyposensitization treatment should be given simultaneously, since gamma globulin had no effect on specific pollen asthma. If a patient fails to respond to 2 injections of the larger dose (0.2 cc. per pound) at three-week intervals given in the fall or winter seasons, the treatment may be discontinued, since improvement occurs immediately or not at all.

THOMPSON, H. T.: Obstruction of the Vesical Neck in Children. (New York State Journal of Medicine 59:4377. December 1, 1959).

Obstruction of the vesical neck as seen in children in the private practice of urology has been presented. Not all of these children were subjected to a battery of tests; rather, each case was individualized.

The evaluation and treatment varies from simple calibration of the urethra and urethral dilatation to the entire gamut of urologic investigation, with voiding cystograms and retrograde study.

It is felt that obstruction of the vesical neck is: (1) the most common cause of urinary difficulty in the child, (2) the most frequent cause of pyuria, and (3) the cause of so-called nonobstructive pyelonephritis.

It must be emphasized that normal intravenous pyelogram findings and the absence of residual urine do not rule out obstruction of the vesical neck.

Ureteral reflux should not be operated on primarily but observed after the obstruction of the vesical neck has been removed. The reflux will disappear and an operation will be unnecessary in the majority of cases.

AUTHORS' SUMMARY

BURT, R. R.: Intestinal Polyps in Children. (Northwest Medicine 57:1004, August 1958).

It behooves all of us to search diligently for possible polyps in any child with blood in the stool, diarrhea, recurrent abdominal cramps or history of mass prolapsing from the anus. In addition to ordinary history and physical examination, sigmoidoscopy and contrast air study of the colon are necessary.

Some polyps will be passed spontaneously; this may account for inability to find a polyp even though symptoms suggested its presence. However, only after repeated examinations should this assumption be made.

Isolated polyps within reach of the sigmoidoscope should be removed, when identified. The young child with several polyps in the colon above this level and with minimal symptoms may be observed for a year or so to determine if diffuse polyposis will develop requiring total colectomy rather than polypectomy.

Incidence of malignancy in adenomas increases at puberty. Therefore, definitive operation should be carried out before this age is approached.

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1. Macy, I. G.; Kelly, H. J., and Sloan, R. E.: with the Consultation of the Committee on Maternal and Child Feeding of the Food and Nutrition Board, National Research Council: The Composition of Milks, Publication 254, National Academy of Sciences and National Research Council, Revised 1953. 2. Brown, G. W.; Tuholski, J. M.; Sauer, L. W.; Minsk, L. D., and Rosenstern, I.: Evaluation of Prepared Milks in Infant Nutrition; Use of the Latin Square Technique, J. Pediat. 56:391 (Mar.) 1960.

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